

Notice of Allowability

Application No.

10/658,154

Examiner

Terry L. Englund

Applicant(s)

BURGENER ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amdt (Dec 7, 2009) and Interviews (Dec 17-18, 2009).
2. ☒ The allowed claim(s) is/are 3-8,10,11,15-27,34-42,46,48-53,55-67 and 69-71 (now renumbered for printing purposes).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>20091217; 20091218</u> . |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>See Continuation Sheet</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Continuation of Attachment(s) 3. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: 20081209, 20090604 & 20091123).

DETAILED ACTION

Response to Amendments/Interviews/IDSs

The proposed amendment (submitted on Nov 13, 2009), formal amendment (submitted on Dec 7, 2009); telephone interviews (e.g. on Dec 17, Dec 18, and Dec 29, 2009); and IDSs (submitted on Dec 9, 2008, Jun 4, 2009 and Nov 23, 2009) have all been reviewed, and/or taken into consideration, with the following results:

After reconsidering the drawing objection cited on pages 4-5 of the previous (Final) Office Action, that objection has been withdrawn. One of ordinary skill in the art understands that a ring oscillator has an odd number of stages, and this number would not be limited to only three stages as shown in the applicants' own Fig. 5.

The proposed amendment submitted on Nov 13, 2009 was in response to an interview on Oct 8, 2009. Several oversights were then discussed over the telephone with the applicants' representative, and a formal amendment addressing those concerns was submitted on Dec 7, 2009.

The cancellation of claims 1-2, 9, 12-14, 28-33, 43 and 68 rendered their respective objection(s), and/or rejection(s), moot.

The objections to claim 19, described on pages 5-6 of the previous Office Action, have been withdrawn. One of ordinary skill in the art would understand what the claim language means.

The amended claims overcame the rejections of claims 3-8, 15-17, 20, and 34-41 under 35 U.S.C. 112 as described on pages 6-7 of the previous Office Action. Therefore, those rejections have been withdrawn.

The amended claims, and/or the applicants' arguments/comments (within previous responses and during telephone interviews) overcame all of the prior art rejections, with respect to the remaining active claims, under 35 U.S.C. 103(a) as described on pages 8-34 of the previous Office Action. Therefore, the following rejections have been withdrawn: 1) claims 18-19, 49 and 70-71, with respect to Imamiya/ Pfiffner; 2) claims 3-4, 10, 16-17, 36-41, 48 and 69, with respect to Imamiya/Ito et al.; 3) claims 5-8, 15, 34-35, 46, 49 and 55-59, with respect to Imamiya/Ito et al.; 4) claims 20 and 22-23, with respect to Imamiya/Pfiffner/Ito et al.; 5) claims 50-51 and 53, with respect to Imamiya/Pfiffner/Clark; 6) claims 24-25, 27, 60-61 and 66-67, with respect to Imamiya/Yamashiro; 7) claims 4, 10, 16-17, 36-41 and 69, with respect to Forbes et al./Ito et al.; 8) Claims 3-4, 10, 16, 48, 50-51, 53, 57-58 and 69, with respect to Tasdighi et al./Yamauchi; 9) claim 49, with respect to Tasdighi et al./Yamauchi/Pfiffner; and 10) claims 50-51 and 53, with respect to Imamiya/Ito et al./Yamashiro/Clark. None of these references clearly shows or discloses the use of capacitive coupling with respect to a "substantially sine-like" signal and a charge pump type circuit, as understood from the claimed limitations, and/or the applicants' arguments/comments/discussions.

The references cited on the Nov 23, 2009 IDS were reviewed and considered. Figs. 3(a)-(c) of Japanese reference 11-252900 were of special interest. Fig. 3(c) shows transfer capacitor 36 that is charged through switches 34 and 35, and the capacitor's charge is boosted and transferred to output 33 through those same switches in their alternate positions. Each of switches 34 and 35 corresponds to the detailed switch part shown in Fig. 3(a), which closely corresponds to the active switches shown in the applicants' own Fig. 6. However, Fig. 4 of the Japanese reference clearly shows the controlling clock signal has square waves (i.e. digital logic

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with only highs and lows), wherein it is understood that the applicants' invention relies on "substantially sine-like" signals as clarified by the applicants' numerous arguments/comments previously submitted, and/or previous discussions during interviews. The other reference cited on the IDS shows/discloses a current starved/limited type ring oscillator, but its waveforms are shown as square waves, or having a trapezoidal shape, wherein neither waveform is considered "substantially sine-like" as previously admitted by the applicants.

The Japanese reference was discussed/considered in some detail during an interview on Dec 17, 2009, and discussed/considered again during an interview on Dec 18, 2009. Also during the Dec 18th interview. Various other references showing a charge pump controlled by a ring oscillator, especially where the ring oscillator had features that would make it current starved/limited, were discussed. However, none of the reference clearly shows or discloses what the applicants' consider a "substantially sine-like" signal.

The references cited on the IDS forms submitted on Dec 9, 2008 and Jun 4, 2009 were also reviewed and considered. None the them clearly shows or discloses what is considered allowable material as described later under the appropriate section. [Note: The Dec 9, 2008 was modified to remove two redundant references (i.e. 6,429,723 by Hastings and 6,906,575 by Tanaka), and more correctly identify the patentee/applicant. This IDS was received after the previous (Final) Office Action had been mailed.]

There are no known objections or rejections remaining within the present application.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

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None of the prior art references reviewed and considered shows or discloses the charge pump apparatus as cited within independent apparatus claims 3-6, 10-11, 15, 18, 21 and 24; or the method of generating an output supply as cited within independent method claims 34, 42, 46, 49, 52, 56 and 60. More specifically, none of the references clearly shows or discloses a charge pump apparatus that comprises: 1) “capacitive coupling circuitry” as cited within claim 3; 2) a “capacitive coupling circuit” as cited within claims 4-5, 24 (upon which claims 25-27 depend) and 46 (upon which claims 48 and 69 depend); 3) “corresponding capacitive coupling circuits” as cited within claim 6, upon which claims 7-8 depend; 4) the “capacitively coupling” as cited within claims 10 and 34, upon which claims 35-41 depend; 5) a second control node AC impedance at least twice the first control node AC impedance as cited within claim 11; 6) the “one or more capacitive coupling networks” as cited within claim 15, upon which claims 16-17 depend; 7) the clock output being “coupled capacitively” as cited within claim 18 (upon which claims 19-20, 22-23 and 70 depend) and 56; 8) a second device area that is greater than double the first device area as cited within claim 21; 9) a control node AC impedance of the discharge output TCCS is at least double a control node AC impedance of the discharge common TCCS as cited within claim 42; 10) the clock output being “capacitively coupled” as cited within claims 49 (upon which claims 50-51, 55, 57-59 and 71 depend) and 56; 11) a control node AC impedance of the second TC discharging switch is at least twice as large as a control node AC impedance of the first discharging switch as cited within claim 52, upon which claim 53 depends; and 12) the first and second “capacitive coupling” networks as cited within claim 60, upon which claims 61-67 depend. Since there is no motivation to modify or combine any prior art reference(s) to ensure all of the limitations within any of the independent claims are met, the

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claims are deemed patentably distinct over the prior art of record. [Note: It is now better understood from previous arguments, comments and discussions from/with the applicants/representative that the capacitive related coupling limitations, cited within most of the independent claims (i.e. claims 3-6, 10, 15, 18, 24, 34, 46, 49, 56 and 60) are due to the clock output being “substantially sine-like” (e.g. claims 15, 20 and 34 clearly cite “the capacitive coupling necessitates the charge pump clock output to be substantially sine-like”, “the capacitive coupling of the charge pump clock output necessitates that the charge pump clock output be substantially sine-like”, and “capacitively coupling...thereby necessitating that the first charge pump clock output be substantially sine-like”, respectively). For example, the previous arguments, comments and/or discussions provided by the applicants, and/or their representative, have helped to clarify that “sine-like” signals do not include signals such as square waves, or trapezoidal type waveforms, as admitted by the applicants.

Claims 3-8, 10-11, 15-27, 34-42, 46, 48-53, 55-67 and 69-71 are allowed, and have been renumbered as 1-3, 5-6, 4, 7-14, 18, 15-16, 19-30, 32-34, 36-38, 43-44, 39, 45, 40-42, 46-53, 35, 17 and 31, respectively for printing purposes. The renumbering takes the cancellation of claims 1-2, 9, 12-14, 28-33, 43-45, 47, 54 and 68 into account, and regroups related claims closer together (e.g. claims 19-20, 22-23 and 70 all depend on independent claim 18).

Prior Art

The prior art references on the accompanying PTO-892 are cited for interest and documentation purposes only. Fig. 4 of Kajimoto shows a voltage switching part (comprising two capacitors, two resistors and two MOS transistors) that closely corresponds to: 1) the active switches shown in the applicants’ own Fig. 6 (e.g. see 618,622,626,630,602,608 and 620,624,

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628,632,604,610); and 2) the switch part (e.g. see C1,C2,R1,R2,Q1,Q2) shown in Fig. 3(a) of Japanese reference 11-252900 cited on the IDS submitted by the applicants on Nov 23, 2009. Fig. 1 of Shearon et al. shows transfer capacitors 11 and 12 coupled to active switches 13-16 and 17-20, respectively, which are controlled by clock outputs that are provided by generator 29 through coupling capacitors 25-28. However, none of these references clearly shows or discloses a clock output that is "substantially sine-like." In fact, each reference clearly shows square wave (i.e. digital logic type) signals (e.g. see Fig. 5 of Kajimoto; Fig. 4 of the Japanese reference; and Fig. 1 of Shearon et al.). Therefore, there is no motivation to use any of these references to meet the capacitively related coupling limitations cited within most of the present application's independent claims, wherein the claims' capacitive coupling is understood to be related to "substantially sine-like" signals as previously described above.

Any comments considered necessary by the applicants must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication from the examiner should be directed to Terry L. Englund whose telephone number is (571) 272-1743. The examiner can normally be reached Monday-Friday from 7 AM to 3 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln D. Donovan, can be reached on (571) 272-1988

The new central official fax number is (571) 273-8300.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1562.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/T.L.E./

Examiner, Art Unit 2816

/Lincoln Donovan/

Supervisory Patent Examiner, Art Unit 2816